Pilot Flight Check

Piper Dakota
The Little Hauler

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The next-to-last Cherokee bit the dust last summer when the Cherokee 235 was transfigured to the Dakota (PA-28-236). Piper may not have been thinking of the load-hauling English version of aviation's iron horse, the Douglas DC-3/C-47, when they conjured-up the name—but the new Dakota can do its share.

Piper's marketing program is to sell the airplane as a businessman/pilot hauler. Recent advertisements position it as competition for Cessna's 230-hp Skylane.

As with all PA-28 derivatives, the Dakota bears the familiar outline of its predecessor; however, aside from the fuselage and tail feathers, there are many changes and detail improvements inside and out. The most apparent change has been made to the wing: it's the longer span, semi-tapered, laminar-flow wing introduced earlier on the Warrior, Archer, Arrow and twin-engine Seminole. Wing section is NACA 65_2-415.

The main spar carries through the cabin via a box structure. There are auxiliary spars front and rear; the latter carries the loads of the ailerons and flaps. The ailerons are longer span and provide better roll response. Each wing contains a single, integral fuel tank in the leading edge with a capacity of 38.5 gallons of 100/130 octane fuel. Usable fuel is 36 gallons per side, or 72 total.

Pilots familiar with the Cherokee 235 will spot additional changes, many of which are the result of closer attention to detail, appearance and aerodynamic efficiency by the manufacturer. The Dakota's cowl is taut-looking. A prominent feature is a much larger spinner; another is the ram air intake, which improves engine breathing. The three-pipe exhaust juts through the bottom of the cowl and has a faired lip ahead

of it to improve flow. Cowl flaps are not used.

Nestled within the close-fitting cowl is a 6-cylinder Lycoming O-540-J3A5D carbureted engine with a power rating of 235 hp at 2,400 rpm. It's mated to a wide-blade Hartzell controllable-pitch propeller. The engine occupies the same space as the four-cylinder Lycomings used in the 160-hp Warrior II and 180-hp Archer II. It is located back closer to the firewall to accommodate the two extra cylinders and other accessories of the larger engine.

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Another item aimed at reducing drag is a set of large wheel pants combined with faired struts, which, the company claims, improves cruise speed by eight knots and range by six per cent. The aerodynamic improvement requires additional effort to check strut and tire inflation and tire wear, since only the lower third of the tire is visible. The air valve is accessible through a small door on each fairing.

Overall, the appearance of the Dakota is pleasing: deep-throated yet sleek. The paint design works very well with the basic lines of the aircraft.

Access to the cabin is standard for aircraft of this type, through a single door on the right side of the fuselage over the wing, with a step below the trailing edge of the flap. The right flap has a lock in the up position to handle people weight, and doubles as a step. A baggage door on the right aft fuselage gives good access to the 24-cubic-foot, 200-pound-capacity luggage bay behind the rear seats.

The latches on the cabin door are positive in operation and provide a good seal; wind noise around the seal is minimal.

Our evaluation aircraft, N22336, is a Piper factory demonstrator fitted with all the deluxe options, including bright royal blue velour upholstery. Cockpit layout is well planned and consistent with what is approaching industry-wide commonality. The basic flight instruments are grouped in a "T" directly in front of the pilot with

Cockpit access is through a single but generous, well-sealed door. There is a large, flip-up door to the baggage compartment. Head on, the more efficient spinner and cowl, and the ram air intake show attention to aerodynamic efficiency. The cowl is easily removable. Underneath, the 6-cylinder, 235-hp Lycoming fits the same space as the 4-cylinder cousins that power the Archer and Warrior models. There's lots of space on the well-organized panel. N22336 has an optional fire extinguisher mounted under the panel above the right seat.

engine instruments below and avionics mounted in the center of the panel above the primary electric switches.

There is an annunciator panel above the flight instruments containing warning lights for vacuum, alternator and oil pressure. Environmental controls and circuit breakers are mounted on the right panel. An engine power quadrant is centrally mounted below the panel with parking brake, rudder trim and microphone below. The latter was the only bothersome feature we found in the cockpit. It was too easy to bump the mike out of its mount when using the brake or setting rudder trim, spilling it somewhere on the deck. This required a lot of groping and head ducking at awkward times.

The fuel selector system is mounted on the left sidewall by the pilot's knee and is simple in operation (off, left or right). However, we would prefer a positive detent for each position, particularly when flying at night.

Elevator trim and the manual flap selector are located between the front seats. We like the manual flaps; they are positive, as quick as one wants and should require less maintenance.

We also like the sun visors, which are transparent, tinted plastic. The visor on the pilot's side incorporates the recommended power setting chart for ready reference. Abbreviated checklists are printed on the instrument panel to the left of the control column.

Cabin space is good for four adults, and comfortable to both eye and body. All four seats have movable backrests, with three positions to accommodate varying sizes and to provide some variation during long flights. The front seats in 22336 have vertical adjustment, an available option. Some pilots —or their passengers—may find that the oversized headrest, which are standard with the deluxe interior, interfere with visibility from the back seats and create a feeling of isolation. Piper offers a low-profile headrest in exchange, which we haven't seen.

Leg room is adequate, although over-six-foot pilots might take up more back seat leg room than we would like. Armrests are molded into the cabin sides in the front cockpit and inertia-reel shoulder harnesses are standard. Shoulder straps are an available option for the rear seats. We think

Piper PA-28-236 Dakota

Basic Price $36,750

Price as tested: $61,819

Specifications

Engine	Lycoming O-540-J3A5D 235 hp @ 2,400 rpm
Propeller	Hartzell Constant-Speed
Wing Span	35 ft
Length	24 ft
Height	7 ft 4 in
Wing area	170 sq ft
Wing loading	17.6 lb/sq ft
Power loading	12.8 lb/hp
Passengers and crew	4
Cabin length	8 ft 1 in
Cabin width	3 ft 5.5 in
Cabin height	4 ft 1 in
Empty weight	1,633.5 lb
Equipped empty weight	1,795.9 lb
Useful load (basic aircraft)	1,366.5 lb
Useful load (as tested)	1,204.1 lb
Payload with full fuel (basic aircraft)	934.5 lb
Payload with full fuel (as tested)	772.1 lb
Gross weight	3,000 lb
Fuel capacity (standard)	77 gal (72 usable)
Oil capacity	12 qt
Baggage capacity	200 lb (24 cu ft)

Performance

Takeoff distance (ground roll)	810 ft
Takeoff over 50 ft	1,300 ft
Rate of climb (gross weight)	965 fpm
Maximum level speed	148 kt
Normal cruise speed	
(75% power, 9,000 ft)	144 kt
(65% power, 12,000 ft)	138 kt
(55% power, 15,000 ft)	131 kt
Economy cruise speed (55% power, 15,000 ft)	125 kt
Range (45-min reserve)	
75% cruise	696 nm
65% cruise	769 nm
55% cruise	800 nm
Service ceiling	17,900 ft
Absolute ceiling	19,000 ft
Stall speed (clean)	63 kt
Stall speed (gear and flaps down)	56 kt
Landing distance (ground roll)	1,040 ft
Landing over 50 ft	1,740 ft

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The Dakota shares the longer span, semitapered wing with the Archer, Arrow, Seminole and Warrior. The longer ailerons provide more effective roll control than the original wing used on the Cherokee line.

they should be standard. The rear seats can be removed to provide a large area for bulky cargo.

Operations

Preflight, start and runup procedures are simple and straightforward. There are no tricks to make transition difficult. The fuel system has a single drain under each wing and there is a gascolator drain on the left side of the cowl. During cold starts in temperatures ranging from 75° down to 20° F, it wasn't necessary to use the primer. Both cold and hot starts were accomplished without fuss, following the technique outlined in the operating manual.

The only fault we encountered in ground handling was caused by the tow bar. It's too short. It fits neatly across the rear bulkhead in the baggage bay and has a positive lock mechanism to keep it in place. But its length puts the pilot's nose right against the spinner. If he slips, he gets a solid wack or a spear job. The large angle also makes it easy for the nose gear attach points to slip, which probably will eventually take its toll on the nose gear fairing and the pilot's equilibrium. It may not sound like much, but trying to move the aircraft on a slippery surface or an incline is more difficult and potentially hazardous than it should be, particularly for an airplane which is otherwise so easy to maneuver during hand towing.

Ground handling under power is good. The Dakota is light on its feet and rudder pressure required for steering is minimal. Turning radius is a handy 30 feet (with braking). Visibility on the ground is good, too. Some old Cherokee pilots may have difficulty until they get used to the longer wing span.

We may have been impressed by the lightness of the Dakota as a result of having anticipated nose heaviness with the larger engine. Light handling continues through takeoff and climb, however. A touch of aft trim and neutral pressure on the yoke gets the nosewheel unloaded and produces an unruffled takeoff. The airplane can be horsed into the air at 50-55 knots or ballooned off the runway with 25 degrees of flaps. But, with a ground run (sea level, standard day) of 810 feet and 1,300 feet to clear a 50-foot barrier, all but the most poorly prepared takeoff sites can result in a positive, short and unspectacular departure.

Best climb rate speed, 85 knots, gives a book climb of 965 fpm at gross and our often-below-gross takeoffs produced solid initial climb rates in excess of 1,100 fpm. The deck angle at this speed is high, however, and was used for the first 500 feet and for instrument departures only. Recommended en route cruise climb is 100 knots, although we found 105 to 110 (depending on load) to be a good combination of rate and visibility over the nose. If you really want to impress your friends, the best angle speed of 73 knots indicated gives a dramatic demonstration of what "hanging on the prop" is like.

In-flight visibility is good. The three side windows provide a lateral coverage of about 270 degrees. Dipping a wing from time to time in climb or descent, particularly in high traffic areas, makes checking below for potential conflicts simple.

Controls are well balanced and light. Takeoff with the 235 horses and fat prop requires a healthy right boot. Rudder pressure is reduced with a fair amount of rudder trim which, if left

on in level flight, makes the airplane transit somewhat sideways. Rudder trim is positive but sensitive. The stabilator tail is positive and the long-span ailerons provide good roll control at low speeds and in turbulence.

The overall responsiveness of the airplane is good. It takes little time to feel confident and competent in the Dakota. Speed control is easy, and reversing vertical direction as in a missed approach or go-around can be accomplished at will, even with full flaps. Lateral stability is the only area we found to present potential problems for the unwary. Minor upset to either left or right, if left untended, resulted in a spiral dive: the airplane did not appear to be self-righting. This isn't a vicious characteristic, since entry is slow and gentle. But, if a pilot were distracted or was unable to fly instruments, he might wake up to the condition after it was well-established and either become disoriented, worsening the spiral dive, or panic and overstress the airplane.

It should be noted that Piper's sales literature states that all but the most basic, VFR-equipped aircraft are fitted with a wing-leveler or autopilot.

Slow flying the Dakota is a good confidence-building exercise. As with most aircraft of its category, stalls take conscious effort to perform clean or dirty, power on or off. Departure stalls call for a very high angle of attack and make one believe it takes a complete clod, who shouldn't be flying in the first place, or a state of full-blown, out-of-control panic, to get into trouble close to the ground.

Approach and landing are as effortless and simple as other maneuvers. It is possible to fit in with high- or low-speed traffic with ease (although a 130-knot approach does mean more time sailing down the runway in ground effect). A comfortable approach speed for most conditions is 85 knots, reducing to 75 over the fence. Maximum flap speed is 102 knots, although we found that even selecting the first notch at this speed produces a definite pitch-up; 90-95 for the first notch seems better, especially since a combination of pitch and gentle throttle reduction gives good, quick airspeed reduction.

There is plenty of pitch power from the stabilator. Full-stall landings are easy to make consistently. Brakes are effective too, unless one plunks the airplane down at too high a speed.

Our time with the Dakota included small degree of wallowing, but the Dakota handles it well. It is fairly short-coupled, and we anticipated a great deal more pitch instability than we experienced. The only time pitch needs much attention is in turbulence during hands-off flight. Once upset, it requires attention to trim to return to hands-off.

Flight in turbulent air produces a a long—2,000-mile—cross-country, operation out of sea-level and high density-altitude airports and both small, uncontrolled and high density, high-performance air carrier airports. We were able to use the airplane at full gross and full cabin at a variety of CG loadings and fairly light (900 pounds under gross). The simplicity of systems and operations and the basic good balance of the airplane made all flights, including day and night IFR and several missed approaches, a pleasure.

The evaluation airplane, N22336, has a basic empty weight of 1,796 pounds compared to the stripped empty weight of 1,633.5. Payload remaining after loading 432 pounds of fuel for maximum-range operation is 772 pounds, or four FAA-standard people and 92 pounds of baggage to reach the maximum gross weight of 3,000 pounds. Maximum landing weight is also 3,000 pounds.

Since the engine was still in its break-in period we limited selection of power settings to fairly high rpm and from 60% to 75% power depending on altitude. Leaning technique was conservative (100 degrees on the rich side of peak according to the exhaust gas temperature gauge). Flight planning at these settings could depend upon an easy 4.5-hour endurance with at least 45 minutes reserve fuel.

It is obvious from our experience in the Dakota that it is a good, high density altitude performer, despite the fact that the engine is normally aspirated. Optimum handbook altitude is 9,000 feet; service ceiling is 17,900. Judging by the climb performance up to 13,000 feet on warmer than standard days, cruise altitudes of 15,000 to 16,000 feet should be reached with no problem (just don't forget the oxygen bottle). The airplane is definitely happier at altitudes above 6,000 feet.

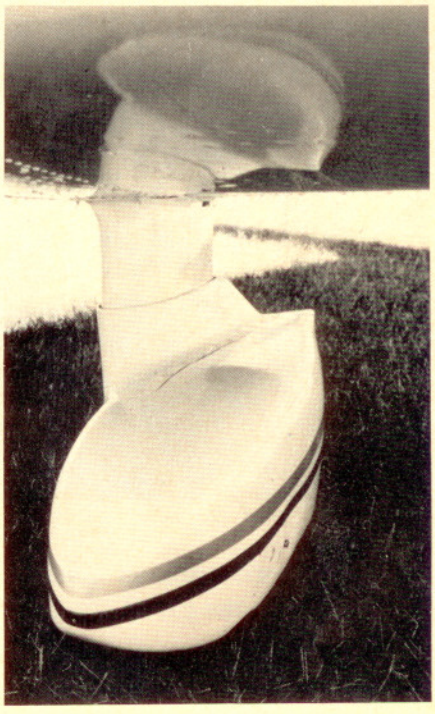
Performance out of high density altitude airports, such as Stapleton at Denver, is good; climb from such airports to continental-divide-hopping altitudes is positive and at a good 500 fpm at high cruise-climb speed.

Above 7,000 feet at cruise, with power settings down to 60% at 2,400 rpm, TAS was consistently above 140 knots, usually 145 knots or better for an average load that was 300 pounds under gross.

Cabin temperatures are comfortable in sub-zero centigrade environment, even for those who like a sauna-like atmosphere. Heat distribution throughout the cabin is good. But watch the heating ducts that run along the spine of the cabin floor; they get very hot and can melt plastic. Our airplane features the optional overhead air ducts and blower fan, which we feel is more than adequate for most conditions and makes the air conditioning system a necessity only in the hottest climates (and the former lists for $675 vs. $2,305 for air conditioning).

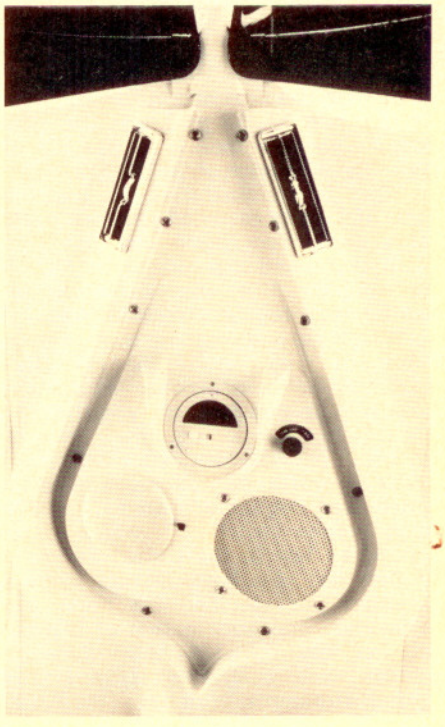
Lighting and cockpit arrangement is good for night flying. It is easy to remember where things are located, and the lights make searching unnecessary for anything save for the unlighted (in 22336, at least) electrical switch panel. Light reflection from the panel in the side windows is slight and not bothersome.

Long spells in the cabin are made easy to take by the combination of good seat design—good lumbar support and adjustable back rest—and visibility. The best testimony for overall cabin comfort is that a passenger who went along for the long cross-country spent 90% of the time sound asleep.



The new, aerodynamically efficient wheel fairings improve cruise speeds by 8 knots and range by 6% over a bare-wheeled Dakota, but they extract a price in terms of more care to check tire inflation and condition.

Optional overhead ventilation system provides good flow at reduced noise level.



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Lots of attention to detail refinements results in a smooth, efficient package. The cowl flares in front of the three-pipe exhaust to reduce turbulent flow and improve extraction.

The Bottom Line

Our factory demonstrator is equipped to the maximum, as one might expect. The only piece of available avionics gear missing is DME. The all-King panel featured two KX170B nav/coms, audio panel, transponder, encoding altimeter, and ADF. An Edo-Aire Piper AutoControl IIIB two-axis autopilot with couplers and automatic trim is also part of the package. The electronics package makes up $14,555 of the total list price of $61,819.

Piper is concentrating on installation of factory installed avionics packages and offers basic one nav/com with transponder packages at $4,255 to complete IFR, shoot-the-works installations ranging above $30,000.

It isn't easy to compare base or even equipped prices from one manufacturer to another because equipment and pricing policies vary greatly. The Dakota has a basic equipped price of $36,750; N22336 carries an additional $25,069 worth of options. The basic price does not include an ELT ($370 with remote switching), which is required by law in the United States.

Our idea of a basic Dakota without avionics but specified for maximum utilization and anticipation of IFR operation would cost $42,680. This includes such basics as lighting and gyro instruments, pitot heat (the PA-28 series, with the pitot/static system mounted under the wing, is very prone to insect or water clogging); it also includes some nice touches, which others might not consider necessary for continuous use, such as super-soundproofing, overhead vent and fan system and rear-seat shoulder harness.

Were we to purchase the aircraft for our own use, there are a few options we would add—zinc chromate primer, stainless steel control cables and tinted windows—bringing the price to $44,260.

We are sure the pricing policy is made considering such applications as foreign markets and a variety of potential uses here in the Northern Hemisphere. However, since we are concerned primarily with owner-flown, personal and business use our idea of basic equipped price is necessarily quite different from that of the manufacturers.

The Dakota offers a well-balanced vehicle for the business and recreational pilot who wants a combination of simplicity, performance and versatility. Load, range and altitude flexibility plus cabin comfort and ease of operation make it a good little hauler with a touch of class—a solid airplane any pilot in the market for a single should consider. □